



United States Environmental Protection Agency

Region 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

Reply To
Attn Of: ECL-116

SUBJECT: Request to Conduct an Engineering Evaluation/Cost Analysis for Proposed Non-Time Critical Removal Action at the Gorst Creek/Bremerton Landfill Port Orchard, Washington

FROM: Jeffry Rodin, On-Scene Coordinator *J. Rodin*
Emergency Management Program

THRU: Chris D. Field, Manager *Chris D. Field*
Emergency Management Program

TO: Danial D. Opalski, Director
Office of Environmental Cleanup

I. PURPOSE

The purpose of this Approval Memorandum is to request and document approval to conduct an engineering evaluation/cost analysis (EE/CA) for a non-time critical removal action proposed for the Gorst Creek /Bremerton Landfill (Site), Port Orchard, Washington.

The proposed EE/CA is expected to be a U.S. Environmental Protection Agency (EPA) lead action due to the reluctance of potentially responsible parties (PRPs) to conduct the action.

This action meets the criteria for initiating a removal action under the National Contingency Plan (NCP), 40 CFR §300.415.

II. BACKGROUND

The CERCLIS ID No. is WAN 001 002 414, and the Site ID No. is 10GL.

A. Site Location

The Gorst Creek/Bremerton Landfill is a closed landfill located in the NW¼ of the SW¼ of Section 1, Township 23N, Range 1W, in Kitsap County, Washington, (EPA 2003b). (Latitude 47° 30' 36.40" North, Longitude 122° 44' 29.40" West.) The Site is located approximately 5 miles southwest of Port Orchard, 6 miles south-southwest of Bremerton, and 1.5 miles west of Gorst, Washington, along the southeast side of State Highway 3 SW. (See Figure 1, Site Location Map.)

The Site is identified by the Kitsap County Tax Assessor as parcel 012301-4-022-1005.

EPAs involvement with the Gorst Creek site began in 2002 when Kitsap County Health Department petitioned EPA to list the site on the NPL. In response EPA conducted an Integrated Assessment in 2004. The site was recommended for future response action.

There have been multiple meetings to coordinate site activities for the Gorst Creek site with concerned stakeholders. Washington State Department of Ecology Toxics Cleanup Program, Kitsap County Health Department, City of Bremerton, and the Suquamish Tribe have all expressed concern and feel the site should be addressed as a priority. Releases occur with every significant rainfall event several times per year. The Suquamish tribe operates fishery downstream of the site. There has also been concern expressed by Kitsap County and Washington State Department of Transportation that a collapse from the landfill could close State highway 3.

Gorst Creek drains to Puget Sound a water body which has been designated a national priority by EPA.

More extensive background information is included as part of the enforcement addendum.

B. Site Description

The Gorst Creek – Bremerton Landfill property encompasses a triangular parcel of approximately 7.5 acres centered over approximately 700 feet of the Gorst Creek Ravine (See Figure 2, Site Plan). An auto wrecking yard (Airport Auto Wrecking,) borders the property to the northeast, and the Washington State Department of Transportation (WSDOT) owns the property adjacent to the landfill to the northwest (downstream), including State Highway 3 SW and an easement corridor on either side of the highway. Gorst Creek flows northwest under the property through an approximate 700 foot-long 24-inch corrugated steel culvert (E & E 2004). Downstream of the landfill, Gorst Creek flows under State Highway 3 SW through a concrete box culvert.

The property began operating as a landfill in 1950 under the name of Ames Auto Wrecking. Beginning in 1980, the landfill operated under the name of Bremerton Auto Wrecking, Inc. until its closure in 1989 by the Kitsap County Health Department due to non-conformance with state and local solid waste regulations.

In 1968, a 24-inch corrugated steel culvert was installed along the base of the Gorst Creek Ravine such that the ravine could be filled with waste, and the creek could flow through the landfill in the culvert (E & E 2004). Waste was placed on top of the culvert until the top of waste became approximately even with the top

of the ravine. There is some evidence that the landfill was extended beyond its original planned limits along the ravine, implying that one or more additional culvert segments may have been placed and covered after the original segment was covered. The original planned limits of the landfill are depicted in Figure 3.

The landfill is estimated to contain approximately 150,000 cubic yards of waste. Potential contaminants of concern (COCs) at the landfill include chlorinated pesticides, polychlorinated biphenyls (PCBs), Target Analyte List (TAL) metals, semivolatile organic compounds (SVOCs), and volatile organic compounds (VOCs). Although the landfill was partially covered with clean fill, it was never properly capped and maintained in accordance with state standards. Information also indicates that medical waste from the Puget Sound Naval Shipyard was received by the landfill (E & E 2004).

In March 1997, after a significant storm event (7.3 inches in a 24-hour period), Gorst Creek backed up on the southeast side (upstream side) of the landfill and overtopped the surface of the landfill, causing a portion of the northwest slope of the landfill to fail and wash into Gorst Creek on the northwest side of the landfill. Landfill debris was found approximately 0.5 miles downstream in Gorst Creek. Following this failure, two riprap catchment berms containing 24-inch corrugated metal pipes were installed in Gorst Creek in an attempt to prevent future possible failures from washing landfill debris downstream. In January 2002, after another significant storm event, Gorst Creek again backed up and overtopped the landfill, resulting in another (smaller) slope failure. Landfill debris was released to Gorst Creek, and the upstream riprap catchment berm was destroyed. The lower riprap catchment berm was still in place as of May 2003 (E & E 2004).

In October 2003, a mobile camera was deployed into the culvert beneath the landfill to identify potential causes for the backup and flooding of the landfill. Review of the culvert inspection video revealed a collapse of the culvert approximately 460 feet upstream of the culvert outflow, severely diminishing the maximum flow capacity of the culvert. A partial collapse was also noted approximately 20 feet downstream of the culvert inflow. Approximately 220 feet of culvert was not inspected/videotaped since the mobile camera was not able to pass the collapse points (E & E 2004 and Bravo 2003).

C. Site Ownership

The site began operating as a landfill in 1950 under the name Ames Auto Wrecking. At this time the property was owned by Mel Marler of Bremerton, Washington, who operated the landfill until 1972. In 1972, the property was purchased by Earl King and Louis King. In 1973, K. R. Crawford and Clara D. Crawford, and Northern, Inc., obtained ownership in a portion of the site. Mr. and Mrs. King, Mr. and Mrs. Crawford, and Northern, Inc., operated the landfill under the name of Ames Refuse - Bremerton Auto Wrecking, Inc., until 1980. In 1980, the property was obtained by Sid Uhinck and Lucille Uhinck who operated the site as Bremerton Auto Wrecking, Inc., until its closure in 1989. Ownership from

the time of closure until 2001 is unknown. In February 2001, the property was obtained from Kitsap County Treasurer by Vern L. Padgett of Tacoma, Washington. In February 2002, Mr. Padgett deeded the property to the Carina Trust. In November 2002, the property was acquired from the Carina Trust by William Nilles (KCHD various dates). S.T. Trust is the current owner of the site which it acquired in 2005.

Washington State Department of Transportation owns the property directly north and west of the landfill. This property contains State Highway 3 SW and an easement corridor on either side of the highway. The property to the northwest of the Site is occupied by Airport Auto Wrecking II, a vehicle salvage yard.

III. NATURE AND EXTENT OF CONTAMINATION

EPA conducted a Preliminary Assessment in 2003 and an Integrated Assessment (IA) in June 2004. During the IA, subsurface samples were collected from six boreholes drilled directly into the landfill, and six surface soil samples were also collected at the same locations. Additionally, three sediment samples were collected from Gorst Creek downstream of the landfill. A summary of the sampling results are listed on the Table 1.

The results of the IA indicate that the Aroclor 1254, benzo(a)pyrene, benzo(a)anthracene, and lead in Site soil samples exceed health-based screening levels. DDT, DDE, Aroclor 1254, and copper exceeded the NOAA SQIRT screening levels in sediment samples. In addition to these contaminants of concern, medical waste may also be present in the landfill. Because of the collapsed culvert underneath the landfill, there is a concern that surface water in Gorst Creek will periodically become impounded behind the landfill during storm events due the culvert's reduced flow capacity, resulting in water flowing over and through the landfill, erosion of the landfill cover, and landfill debris entering the creek and migrating downstream.

IV. THREAT TO PUBLIC HEALTH, WELFARE, OR THE ENVIRONMENT

Substances found in the Site, including the substances identified above in the Nature and Extent of Contamination, constitute "hazardous substances" as defined by Section 101(14) of CERCLA, 42 U.S.C. § 9601(14).

A. Human Health and the Environment

The primary exposure pathway of concern to human populations, animals, and the food chain is the surface water pathway. A tribal fishery is located near the mouth of Gorst Creek, on Sinclair Inlet, approximately 3.72 miles downstream of the site. The fishery is supported by a tribal Chinook salmon fish-rearing facility, located on Gorst Creek approximately 1 mile upstream of the confluence with Sinclair Inlet. (Zischke 2003).

Federal-listed threatened species are documented to exist within the 15-mile target distance limit (TDL) of the site. The Federal-listed threatened Chum salmon (*O. keta*) and Chinook salmon (*O. tshawtscha*) use Gorst Creek for spawning from the headwaters of the creek down to its mouth in Sinclair Inlet, including the portion of the creek that crosses underneath the site landfill. (Huff 2003a, WDFW 2002).

There are 2.6 miles of wetland frontage along the 15-mile TDL; there are 633.7 acres of designated wetlands within 4 miles of the site (EPA 2003b). The nearest wetland to the site along the surface water TDL is located on Sinclair Inlet approximately 3.72 miles downstream of the site. All wetland frontage occurs on the waters of the Puget Sound. (USFWS 1997a, 1997b, 1997c, 1997d, 1997e, 1997f, 1997g, and 1997h).

The soil exposure pathway is evaluated based on the threat to the nearby residential population and other visitors from soil contamination (hazardous substances and potential medical waste) within the first 2 feet of the surface. Although vehicular access to the Site is restricted to an easement through the Airport Auto Wrecking facility, the site is not fenced and access to pedestrians is not restricted. The population residing within a 1 mile travel distance of the site includes 729 people; there are 6,434 permanent residents within a 4-mile radius of the site (EPA 2003b). There are approximately 10 workers at the adjacent Airport Auto Wrecking, facility (located approximately 500 feet northeast of the site).

B. Expected Change If No Action Is Taken

If no action is taken, or if this action is delayed, the result will be:

- Exposure to nearby human populations, animals, and the food chain from contaminants.
- Contamination of sensitive ecosystems including wetlands.
- Contamination of threatened species habitat, including chum salmon and chinook salmon.
- Migration of contaminants within the landfill.
- Continued erosion and degradation of the landfill will cause contaminants to migrate or be released.

V. ENDANGERMENT DETERMINATION

The actual or threatened release of hazardous substances from this Site may present an imminent and substantial endangerment to the public health, welfare, or the environment within the meaning of Section 106(a) of CERCLA, 42 U.S.C. § 9606(a).

VI. PROPOSED PROJECT/OVERSIGHT AND COSTS

The EE/CA will assist with defining the scope of the non-time-critical removal

action. Based on the analysis of the nature and extent of contamination and on the cleanup objectives developed as part of the EE/CA, a limited number of removal action alternatives will be identified and evaluated against the scope, goals, and objectives of the removal action. The removal action alternatives to be evaluated include: 1) Excavation and off-Site disposal with restoration of Gorst Creek; 2) Stabilization and capping of the landfill with the installation of a by-pass channel for surface water in Gorst Creek; and 3) Stabilization and capping of the landfill with installation of conveyance piping beneath the landfill (pipe jacking).

The preliminary designs and cost estimates for the alternatives will be analyzed in terms of effectiveness, implementability, and cost. Cost analyses will include estimates of future operation and maintenance cost for the removal alternatives. Removal alternatives will be ranked in a comparative analysis, and a preferred alternative will be recommended. The draft EE/CA report will include evaluation and summary of site background information as well as the characterization and assessment data collected in the tasks described above. A community relations and public participation plan will be prepared and implemented prior to finalizing the draft EECA. The estimated cost to prepare the draft EE/CA report, including site characterization, surveying, and other related tasks, is approximately \pm \$200,000.

The scope of work is outlined in more detail in the Scope of Work attachment.

VII RECOMMENDATION

Conditions at the Gorst Creek—Bremerton Auto Wrecking Landfill meet the criteria in the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.415, and I recommend your approval to conduct an EE/CA.

Approval:

X

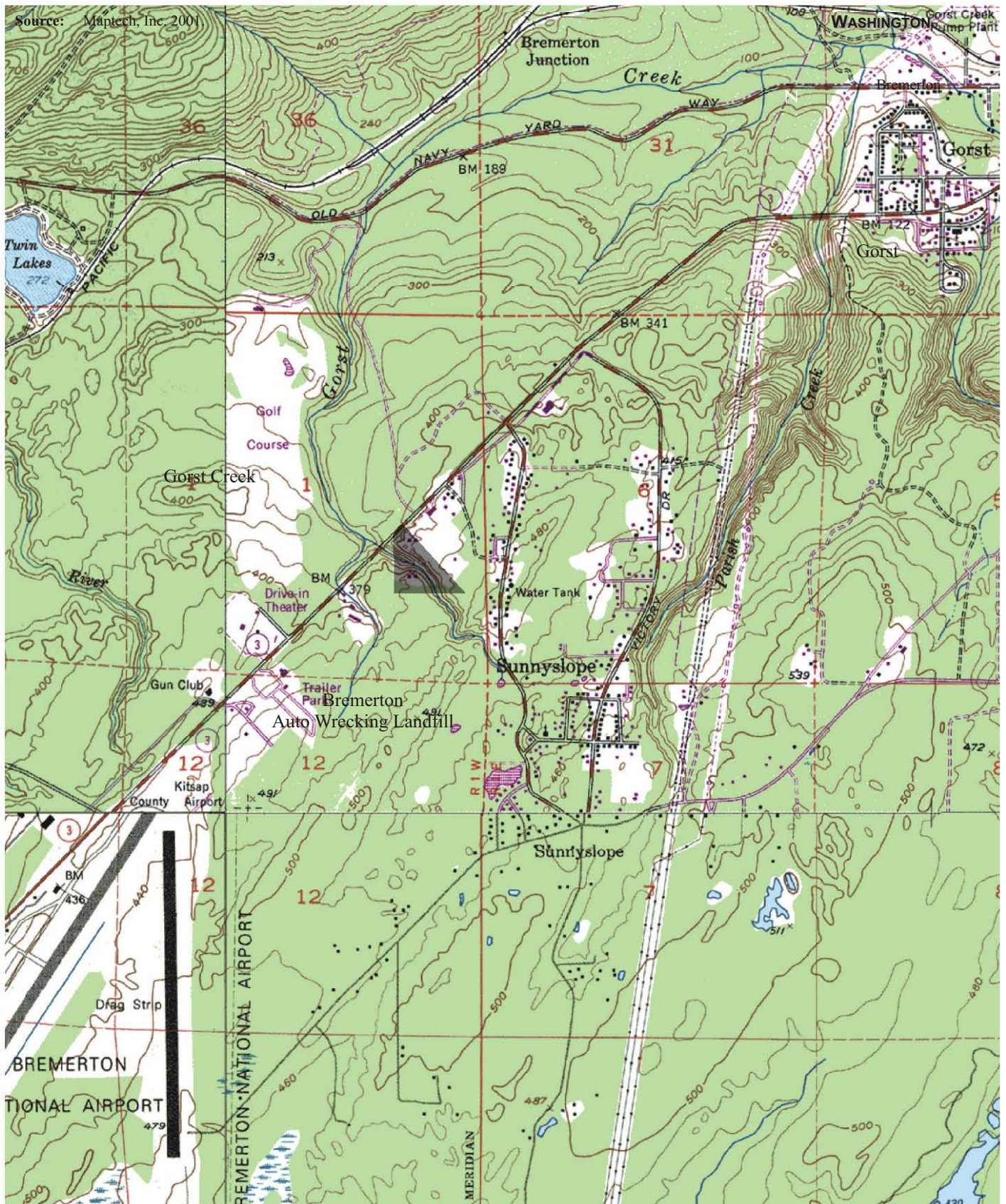
Disapproval:

Signature:



Date:

3/25/2011



GORST CREEK-BREMERTON
AUTO WRECKING LANDFILL
Port Orchard, Washington

Figure 1

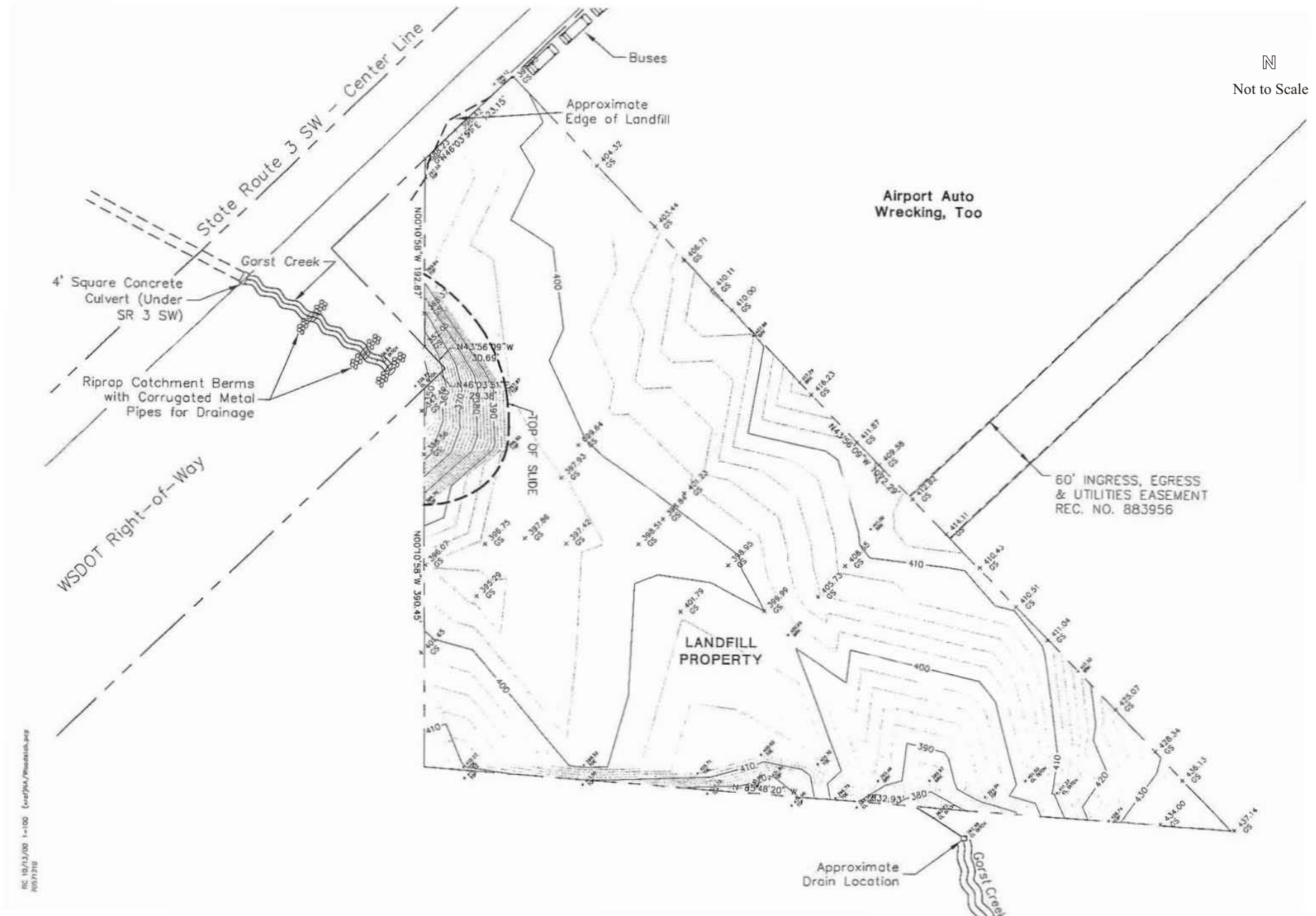
SITE LOCATION MAP

ecology and environment, inc.
 & International Specialists in the Environment
 Seattle, Washington

0 1000 2000
 Approximate Scale in Feet

Date: 9-18-08 Drawn by: AES 10:START-2\08090006\fig 1

N
Not to Scale



GORST CREEK-BREMERTON
AUTO WRECKING LANDFILL
Port Orchard, Washington

Figure 2
SITE CONDITIONS (2000)

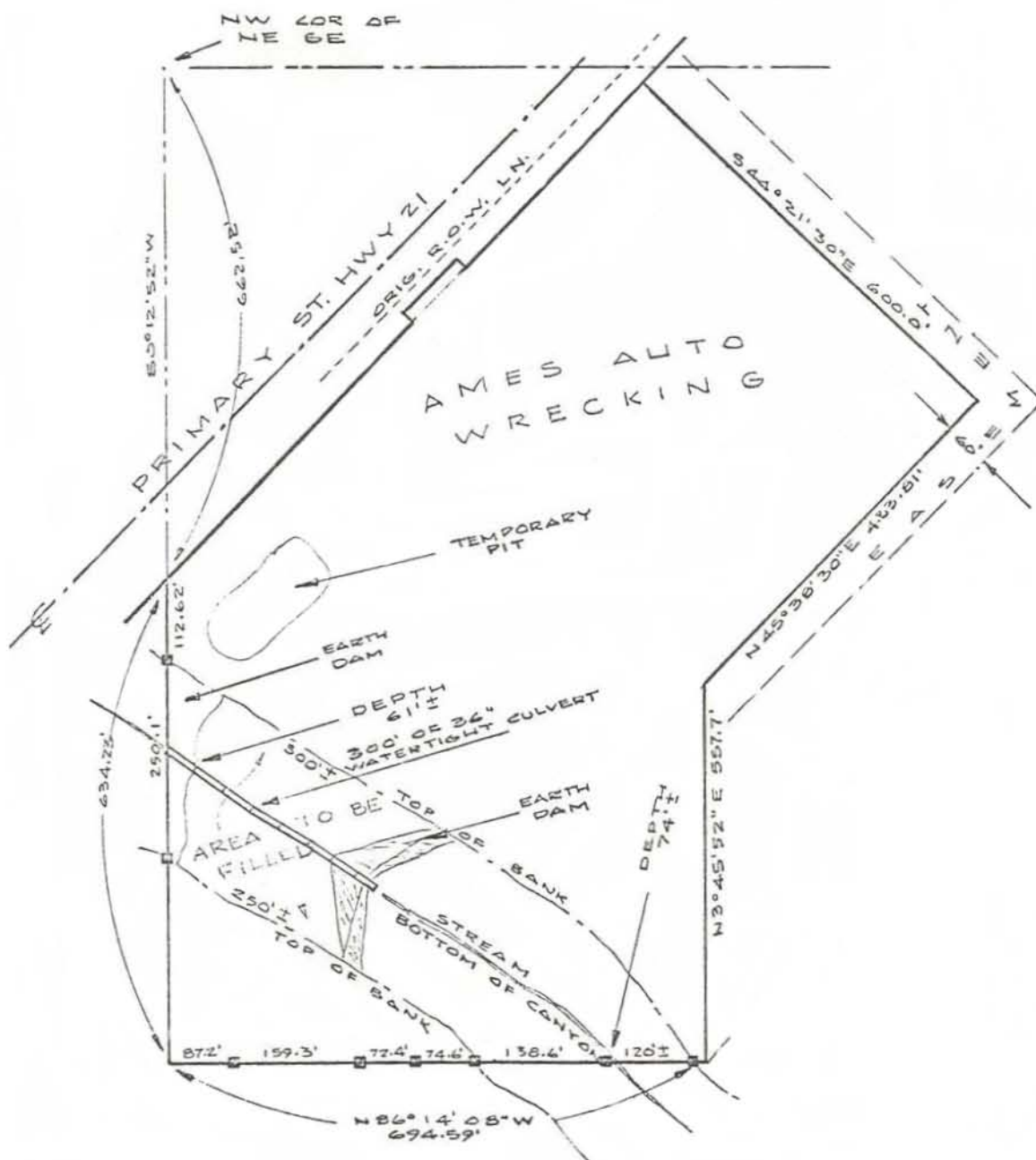
ecology and environment, inc.
& International Specialists in the Environment
Seattle, Washington

Source: EPA, 2002.

Date:
9-18-08

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AES

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GORST CREEK-BREMERTON
AUTO WRECKING LANDFILL
Port Orchard, Washington

Figure 3
SITE PLAN (1968)

Table 1. Summary of Integrated Assessment Sample Results

Surface Soils: Six samples at same location as soil borings				
Compound	Concentration Range	EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites		Frequency of detection
		Residential Soil	Industrial Soil	
DDT	4.9 – 54 JH µg/kg	1700 µg/kg	7000 µg/kg	4 of 6
Aroclor 1254	50 – 88 J µg/kg	220 µg/kg	740 µg/kg	2 of 6
Lead	9.6 – 278 mg/kg	400 mg/kg	800 mg/kg	6 of 6
Mercury	0.19 – 0.62 mg/kg	5.6 mg/kg	34 mg/kg	2 of 6
Subsurface Soils: Six soil borings				
Compound	Concentration Range	EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites		Frequency of detection
		Residential Soil	Industrial Soil	
DDT	6.9 – 43 µg/mg (77 JH µg/kg)	1700 µg/kg	7000 µg/kg	6 of 6
DDE	7.5 – 40 µg/kg	1400 µg/kg	5100 µg/kg	6 of 6
Aroclor 1254	65 – 280 µg/kg (370 J µg/kg)	220 µg/kg	740 µg/kg	5 of 6
Lead	2.5 – 1410 mg/kg	400 mg/kg	800 mg/kg	6 of 6
Mercury	0.13 – 1.1 mg/kg	5.6 mg/kg	34 mg/kg	3 of 6
Sediments: Three downstream samples				
Compound	Concentration	NOAA SQIRT (PEL)	Frequency of detection	
DDT	88 J µg/kg – 340 J µg/kg	4.77 µg/kg	2 of 3	
DDE	33 J µg/kg – 110 J µg/kg	6.75 µg/kg	2 of 3	
Aroclor 1254	750 J µg/kg – 2500 UJ µg/kg	340 µg/kg	1 of 3	
Copper	9.5 JH – 201 JH mg/kg	197 mg/kg	3 of 3	
Lead	2.7 – 47.5 mg/kg	91.3 mg/kg	3 of 3	
Zinc	24.5 – 159 mg/kg	315 mg/kg	3 of 3	

Key:

DDE Dichlorodiphenyldichloroethylene

DDT Dichlorodiphenyltrichloroethane

J Estimated value

JH Estimated Value – Quantified using peak heights rather than peak areas (High bias)

mg/kg milligrams/kilogram

NOAA National Oceanic and Atmospheric Administration

PEL Probable Effects Level

PRG Preliminary Remediation Goals

SQIRT Screening Quick Reference Tables

µg/kg micrograms/kilogram

Gorst Creek/Bremerton Landfill

Other Issues – EPA and Local Involvement

City of Bremerton Public Works and Utilities has received an EPA Puget Sound Watershed Management Assistance Program grant to conduct a Comprehensive Watershed Plan for Sustainable Development and Restoration of the Gorst Creek Watershed. The grant is managed by the Office of Ecosystems Tribal and Public Affairs, Puget Sound Team.

The project outlined under the grant will involve:

- Conducting a Watershed Characterization Study
- Developing a Land Use Plan and Development Regulations
- Developing a Planned Action Environmental Impact Statement to analyze impacts of planned development of the Gorst Watershed
- Developing a Storm water Plan
- Developing a Capital Improvement and Corrective Action Plan
- Engaging the public through a series of meetings and developing informational handouts to convey the findings of the Comprehensive Plan and other deliverables.

The Watershed Characterization will develop information to support the land use plan, stormwater plan, and capital improvement plan for the Gorst Watershed. In addition, existing conditions information developed for the WC will be incorporated into the Planned Action EIS.

The purpose of the characterization is to provide information that can be used to guide development within the Gorst Watershed in a way that maintains, and preferably improves, the quality and condition of freshwater, marine, and terrestrial resources of the watershed and adjacent areas of Kitsap County.

SCOPE OF WORK

Engineering Evaluation/Cost Analysis for Proposed Non-Time Critical Removal Action
at the Gorst Creek/Bremerton Landfill Port Orchard, Washington

Topographical Survey

This task includes a topographical survey of the entire site. The information is necessary to accurately estimate the amount of landfill waste materials, determine the gradient of Gorst Creek through the site, design conceptual removal options, and calculate material volumes for cost estimation. The estimated cost for a topographical survey is \pm \$25,000.

Sampling/Site Characterization

This task includes sampling within the landfill and at downstream locations, and would include both surface and subsurface sampling of soil and water. Sampling is necessary to help characterize waste materials within the landfill, and assess contaminant leachability and mobility. A physical evaluation of the waste material will help determine the amounts of hazardous and non-hazardous waste materials and assess the feasibility of removal action alternatives. For example, the practicality of horizontal boring and pipe-jacking a new drain pipe through the landfill depends largely on the physical nature of the waste materials, such as the presence of large automotive waste. Downstream sampling is needed to assess sediment, surface water, and groundwater impacts from the landfill. The estimated cost for additional site characterization is approximately \pm \$40,000.

Biological Assessment

Conduct a biological assessment to evaluate any threatened, or endangered species in the area or critical habitat.

Geotechnical Characterization

This task which includes sampling within and adjacent to the landfill is needed in order to evaluate soil properties for design of bypass structures, slope modification, and other potential removal options, and to determine presence of bedrock, boulders, or other geologic conditions that would impact feasibility of alternatives. Cost for a geotechnical characterization is approximately \pm \$20,000.

Hydrologic Analysis of Basin

Determining the peak flow in Gorst Creek at the landfill location is needed to conceptually design and evaluate stream bypass options. Cost is estimated at \pm \$5,000 for this task.

Streamlined Risk Evaluation

EPA guidance for EE/CA's recommends completing a streamlined evaluation of risk as part of the site characterization. Cost for this task is estimated to be \pm \$5,000 to \$10,000.

Prepare Draft Engineering Evaluation/Cost Analysis Report

The EE/CA report will be prepared in accordance with EPA guidance and include the streamlined risk evaluation. Removal action objectives for the Gorst/Bremerton Landfill will be developed based on Applicable or Relevant and Appropriate Requirements (ARARs).

This will include a list of ARARs for fish passage requirements, such as the Washington Department of Fish and Wildlife fish passage guidelines. The appropriate target fish species, and the relevant issues for determining fish passage through the project site for these species, will be determined. Existing information about the salmonid species present in Gorst Creek, the downstream conditions, and any available watershed management plans will be identified. The information will be used to incorporate appropriate fish passage features into the remedial alternatives developed in the EECA. Removal action alternatives will be identified.